

Bringing the Bottom Up: An intervention that worked

Skylight Science Supper Series
20 January 2011

Presenter: Sara Harris, with input and inspiration from
Louis Deslauriers, Erin Lane, and Carl Wieman

What is an "intervention"?

1. Identify students who appear to need help
2. Do something that you think will help them

Then, ideally...

3. Measure the effects
4. Iterate

What are some common interventions?
*(make a list of possibilities
at your table)*

These interventions:

1. **PHYS 250**, summer 2009, 67 2nd year engineering physics students. *Louis Deslauriers and Carl Wieman*
2. **EOSC 112**, fall 2009, 182 students from all years, all faculties. *Sara Harris w/help from Erin Lane and Roger Francois*
3. **EOSC 112**, fall 2010, 164 students from all years, all faculties. *Sara Harris*

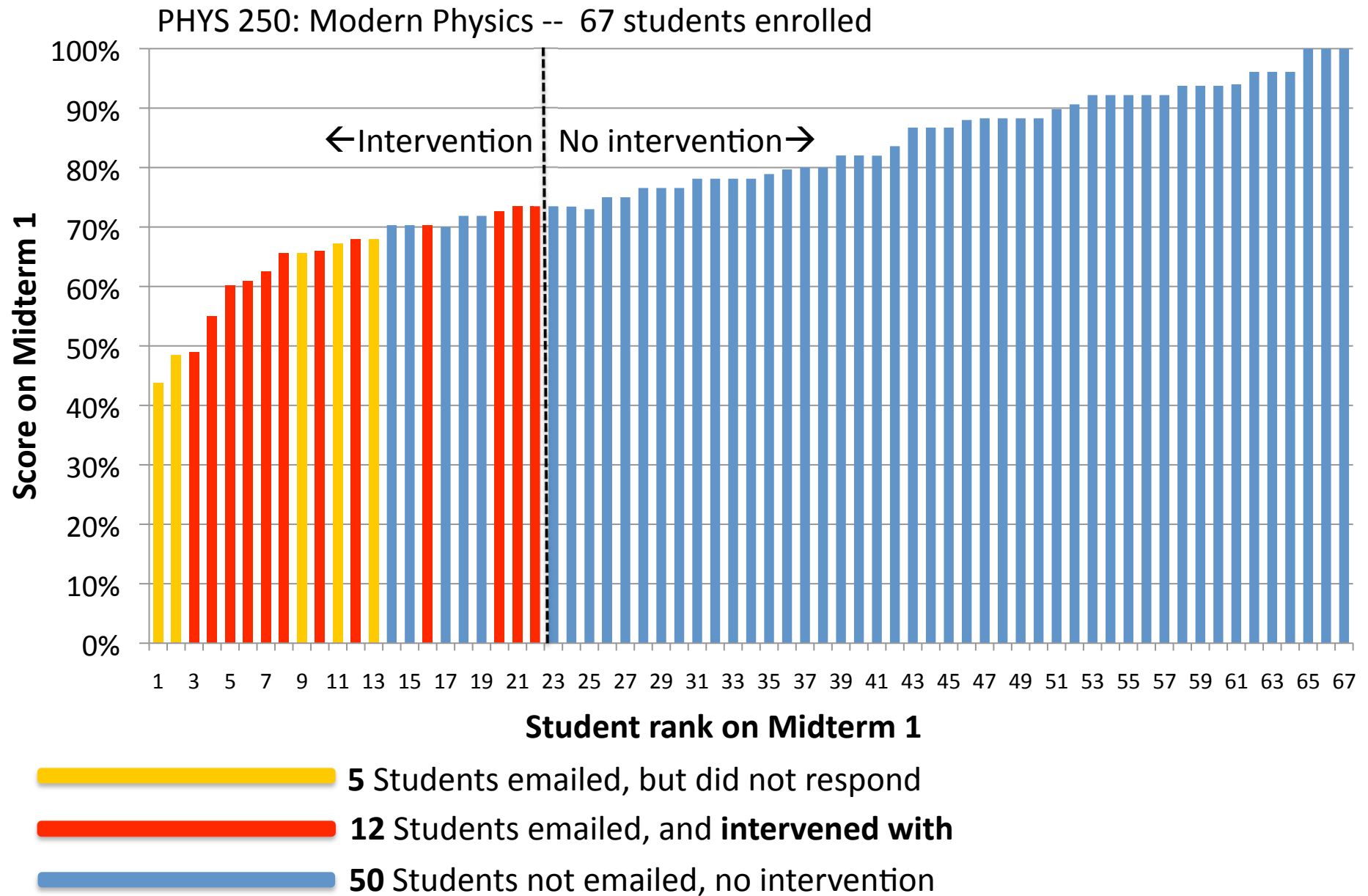
(All slightly different)

How do you decide who gets
an intervention?

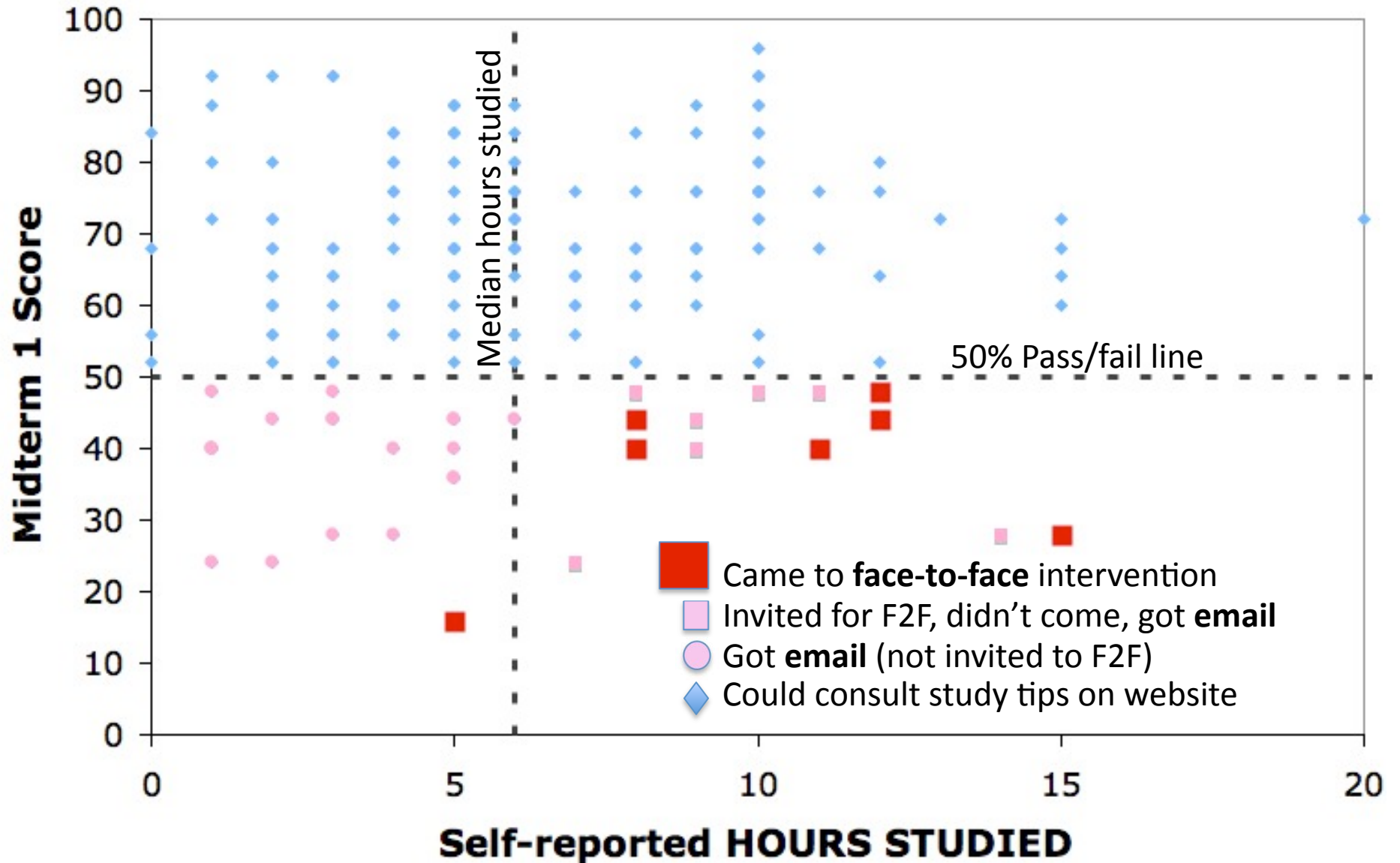
*(Make a list of possibilities
at your table. Include both what's
actually done and what you think
would be ideal.)*

Who gets an intervention?

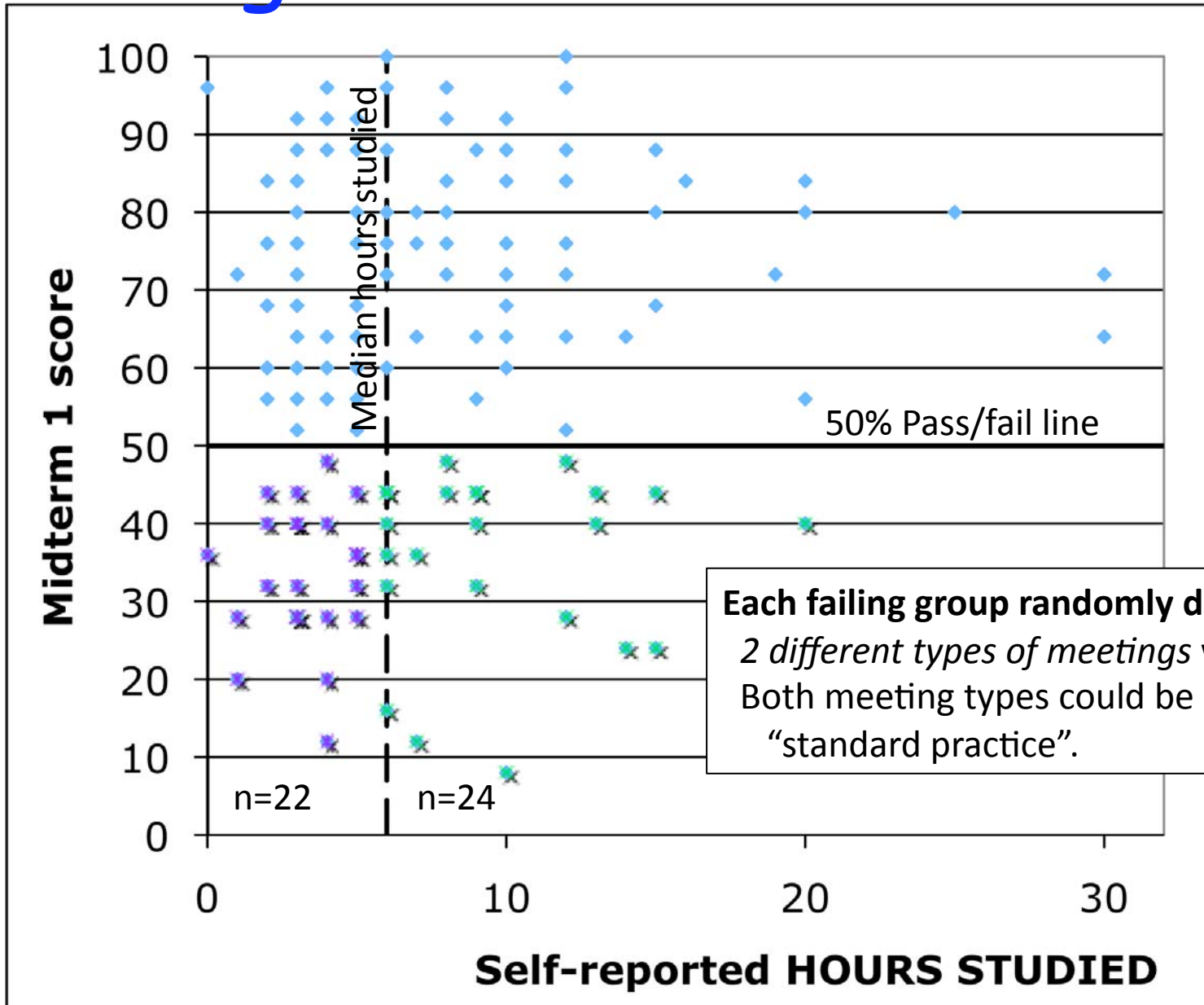
PHYS 250



Who gets an intervention?



Who gets an intervention?



Each failing group randomly divided into 2:
2 different types of meetings were held.
Both meeting types could be considered
“standard practice”.

So, you've...

Identified the students,

Decided to intervene with a meeting,

Invited them to meet with you,

Worked out all the scheduling...

**What do you want to do at the
intervention meeting?**

(Make a list at your table)

This intervention = a conversation

PHYS 250 – Summer 2009

How was the exam?

How did you study?

How do you think you could study better?

→ Students were asked to do specific activities to study for the next midterm

EOSC 112 – Fall 2009

How did you study?

How do you think you could study better?

→ Discussed key points in “How to Study for EOSC 112” document

→ Discussed an example of a practice question linked to a learning goal

→ Students were told the exam questions are written from the learning goals

→ Students were given 2 short handouts about learning effectively

EOSC 112 – Fall 2010

→ Students filled out a paper survey about what they did to study

THEN EITHER:

CONTENT MEETING:

Students viewed their exam

Students asked content questions

We discussed what they got wrong

OR

STUDY SKILLS MEETING:

Similar to EOSC 112-2009

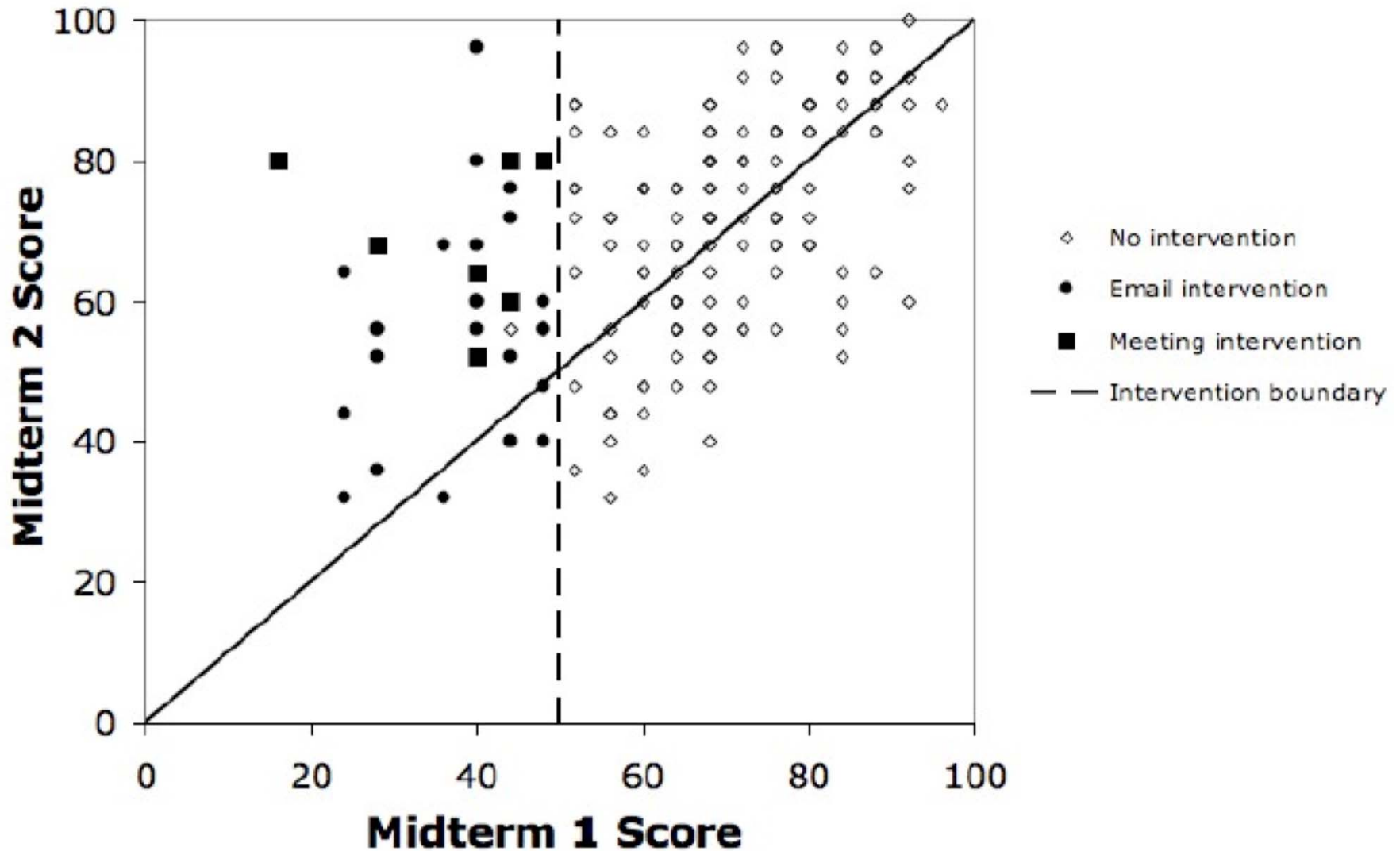
Did students do better after an intervention?

PHYS 250

	M1 (%)	M2 (%)	Final Exam (%)	FE -M1
10 students (with intervention)	64.5	83.4	72.6	8.1
Next 16 student (w/o inter. or email)	77.4	80.3	72.9	-4.5
Entire class except 10 intervened stds	81.5	83.1	76	-5.7

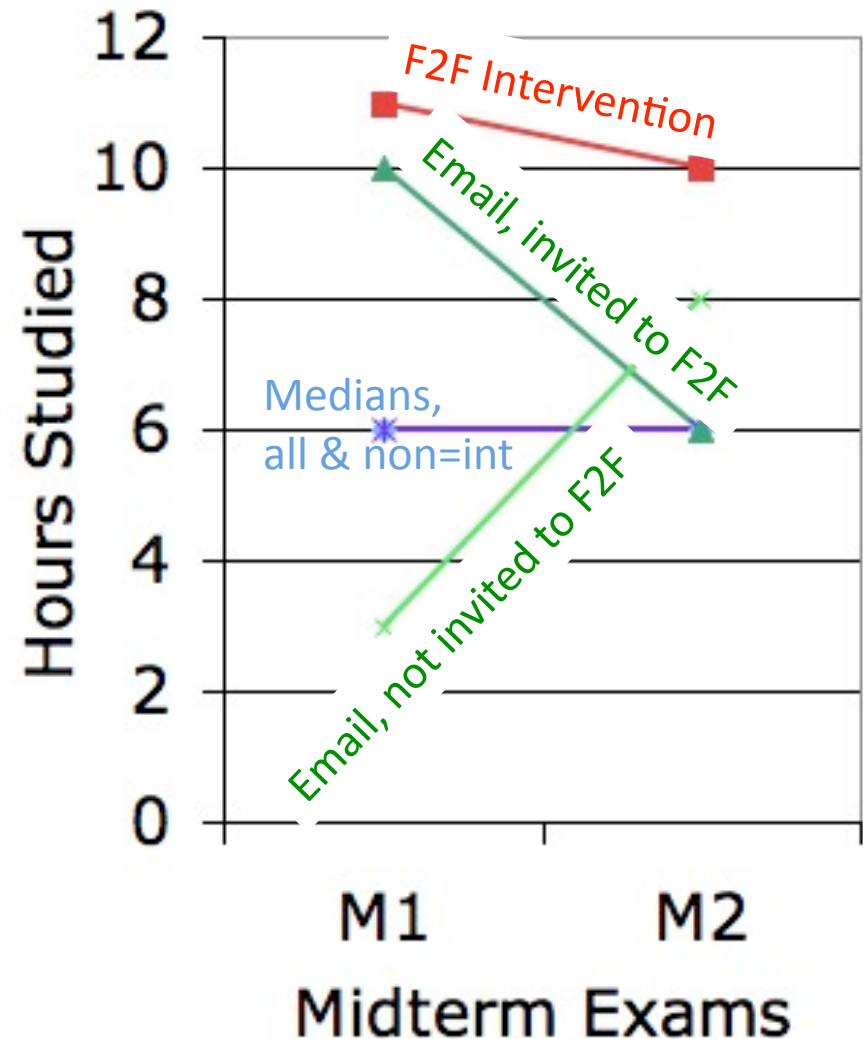
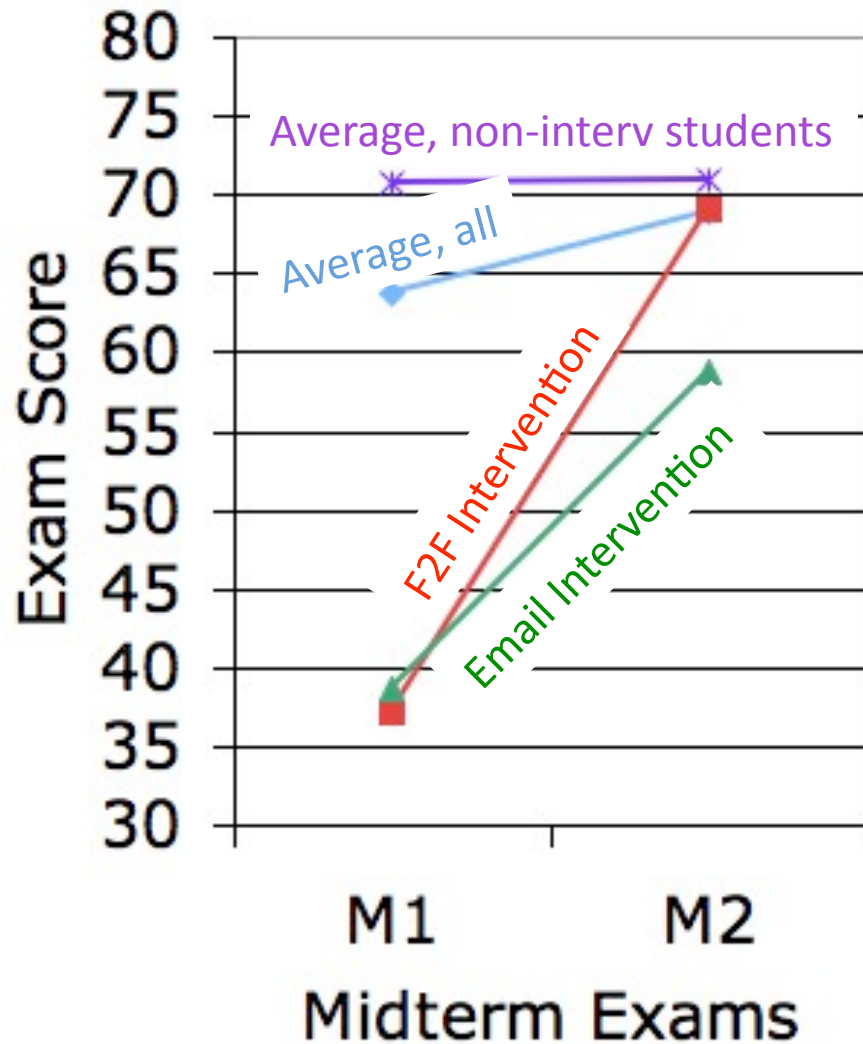
Do students do better after an intervention?

EOSC 112
Fall 2009



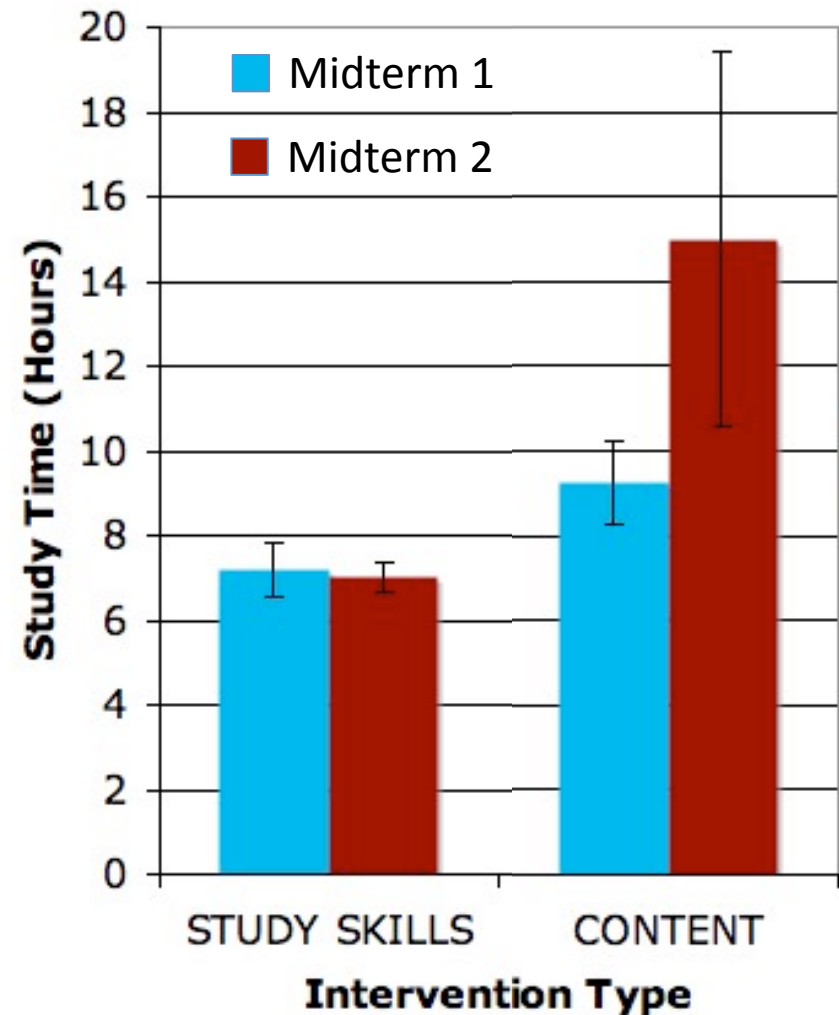
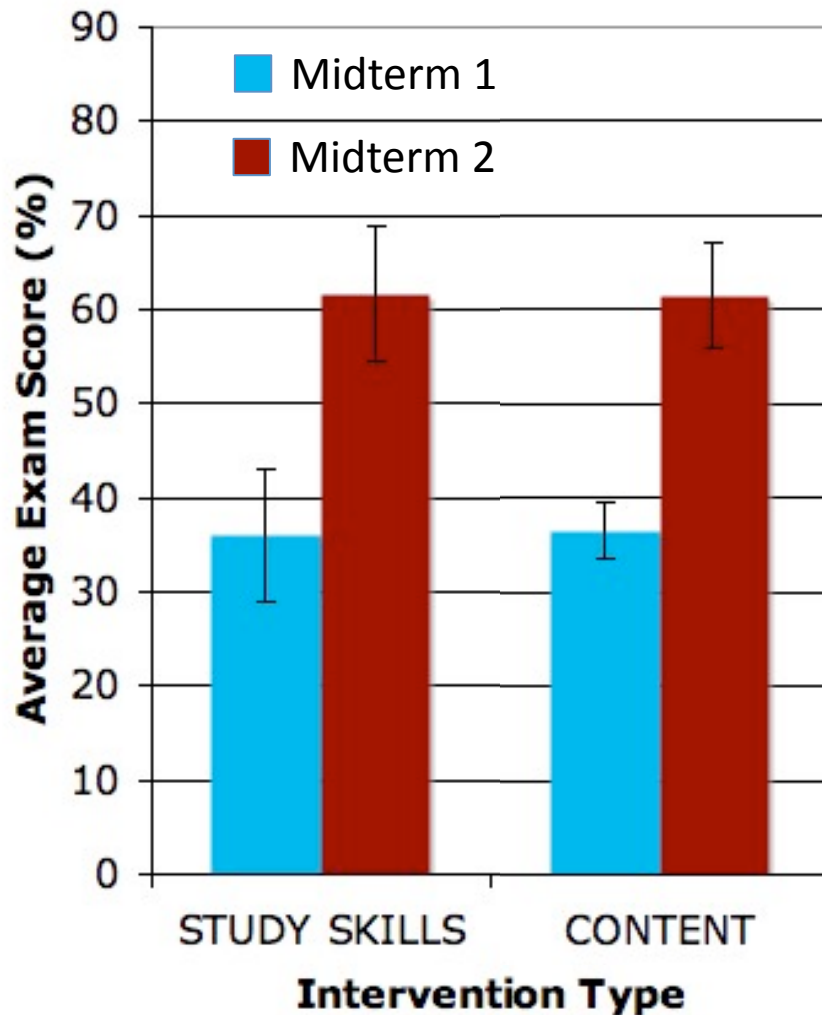
Do students do better after an intervention?

EOSC 112
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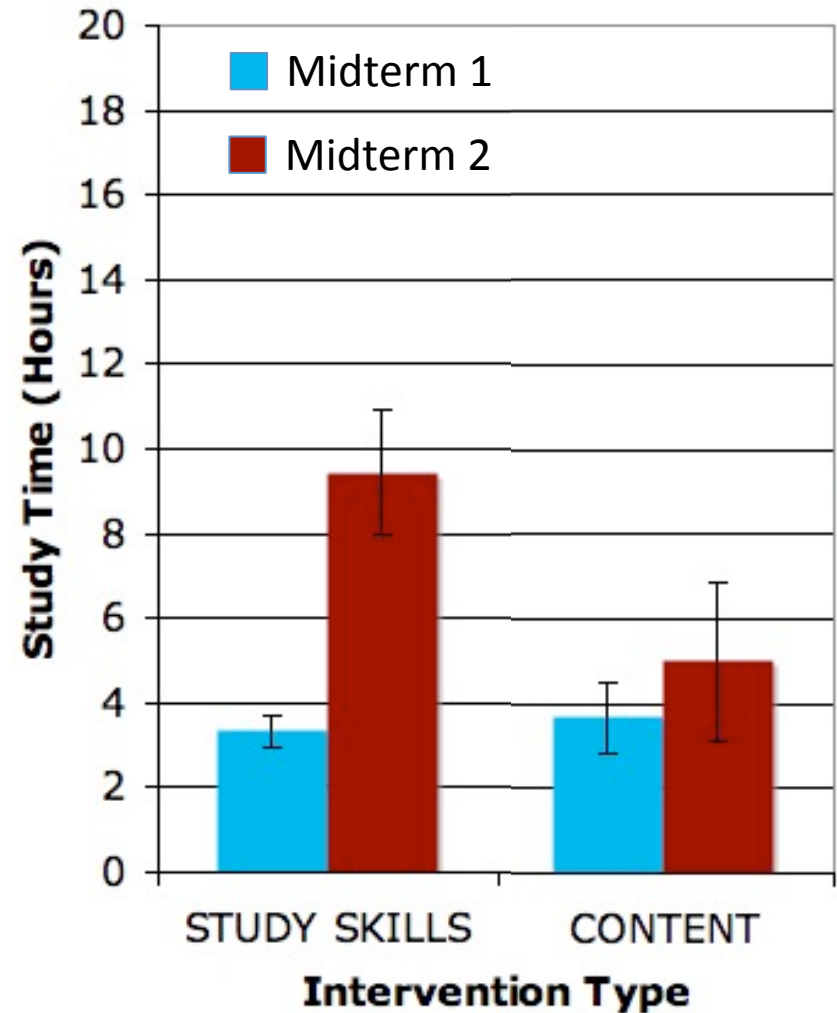
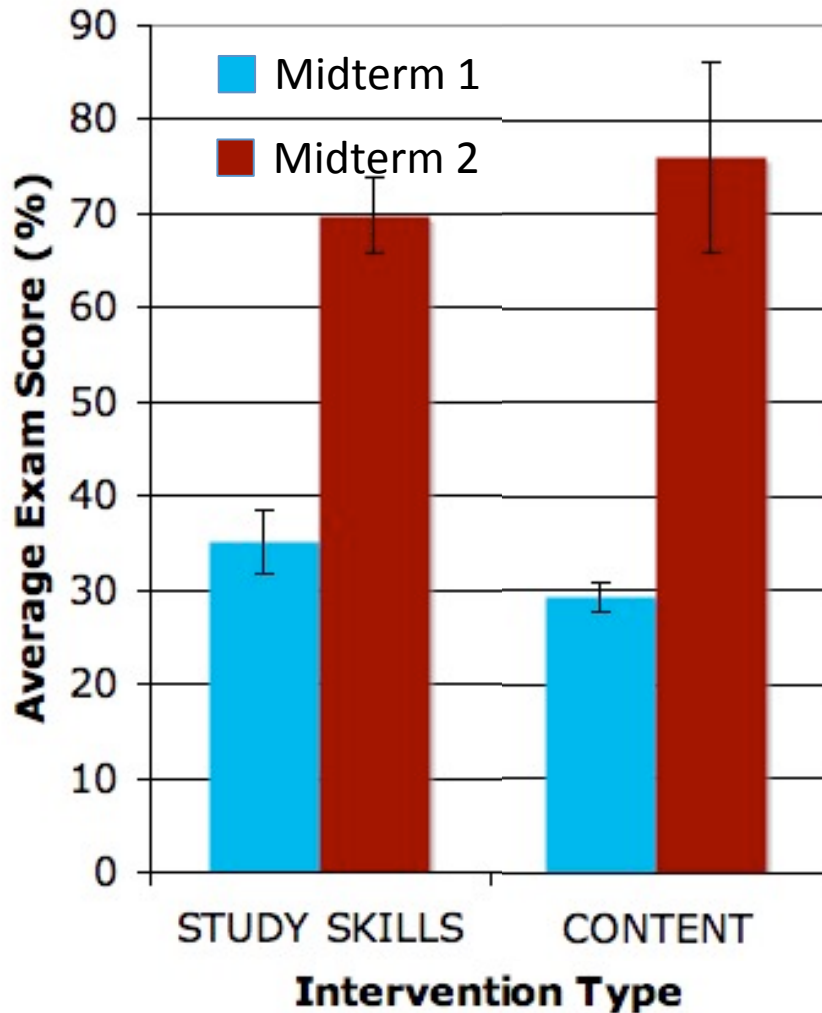
What's better for an intervention? "CONTENT" or "STUDY SKILLS"?

STUDENTS WHO STUDIED \geq CLASS MEDIAN TIME



What's better for an intervention? "CONTENT" or "STUDY SKILLS"?

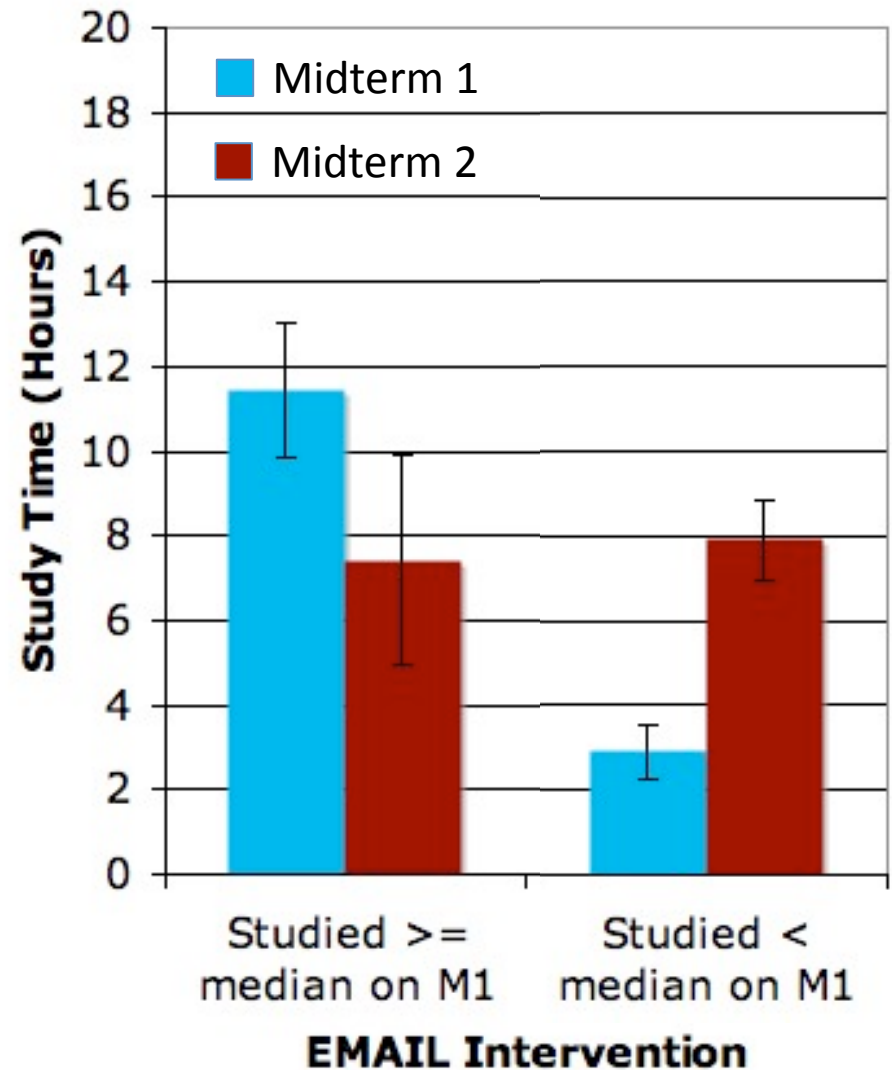
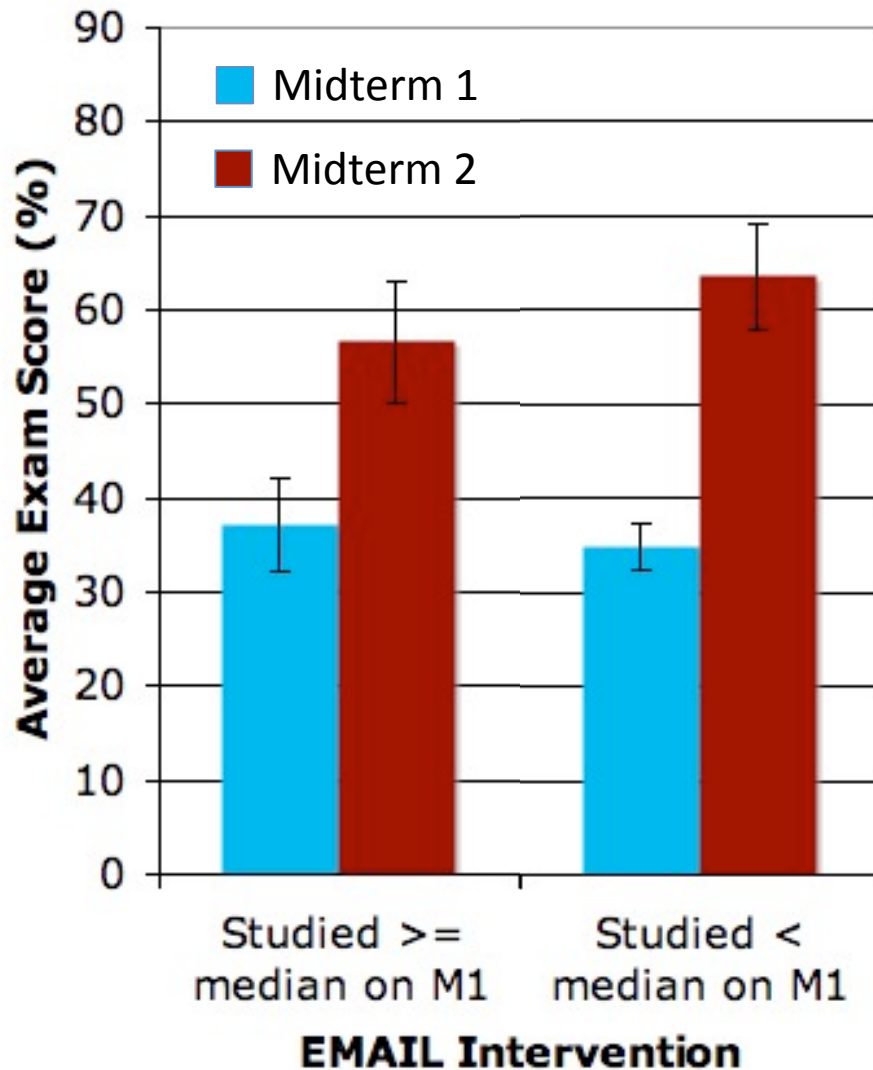
STUDENTS WHO STUDIED < CLASS MEDIAN TIME



How about just an EMAIL?

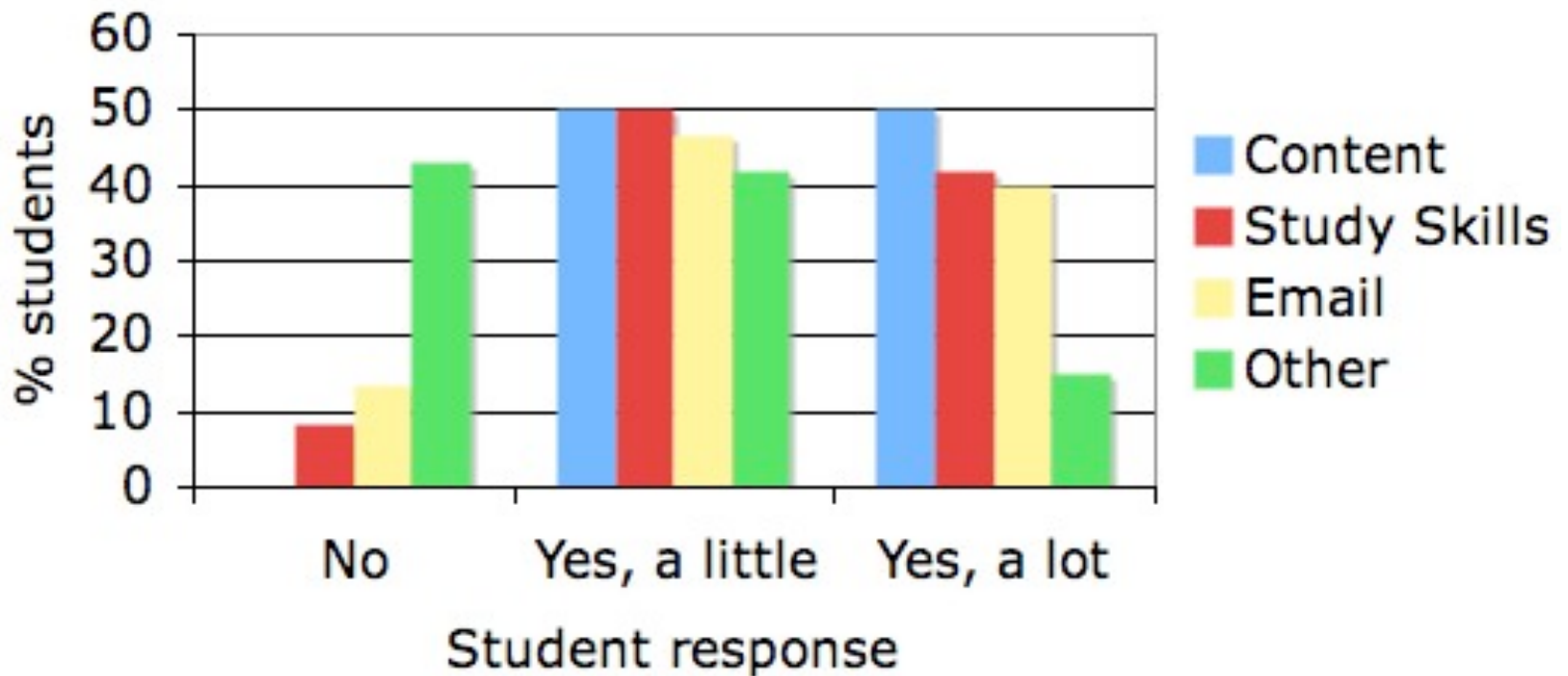
EOSC 112
Fall 2010

STUDENTS WHO CHOSE NOT TO MEET (the "email" groups)



Intervention students report changing study habits more than non-intervention students

Did you modify your study habits during the second half of the term, compared to the first half?



WHAT did they do differently?

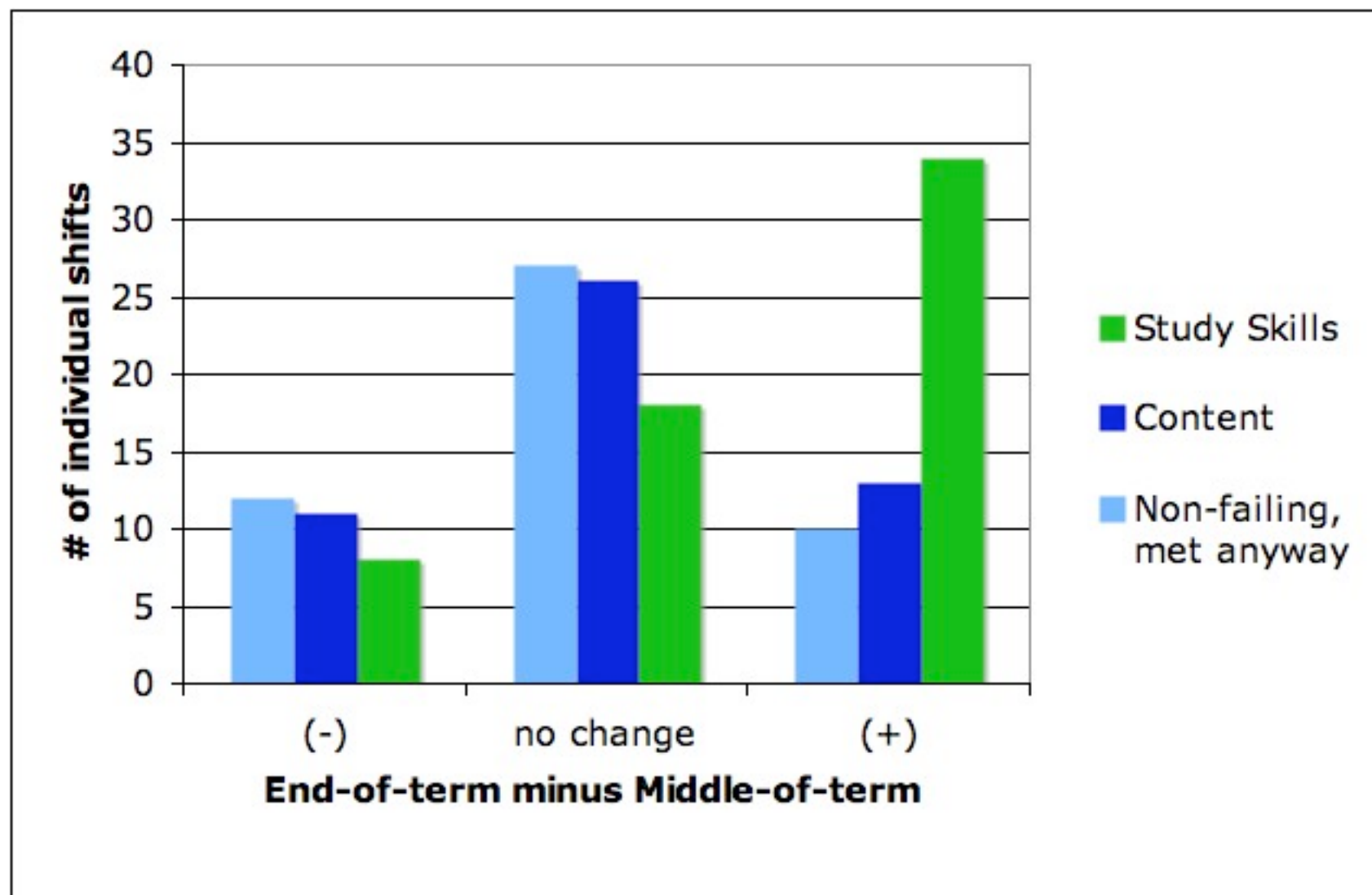
(bold="recommended", plain="fine idea", italics="waste of time")

Answers: "Not at all", "A little", "Some", "A lot"

Survey questions asked both during the
intervention and at the end of term

- 1. I tried to "do" the learning goals**
- 2. I matched practice questions, clicker questions, and quiz questions to the learning goals**
- 3. I used the learning goals to target my studying.**
- 4. I studied with other students**
- 5. I wrote, or re-wrote, my own notes outside of class**
6. I read the instructor's notes
7. I took my own notes in class
8. I studied the quiz/self-test questions
9. I studied the practice questions
10. I studied the clicker questions
11. I made up my own practice questions
- 12. I highlighted important passages in the notes*

"STUDY SKILLS" students had significantly more positive shifts in their answers to the "recommended" actions



Conclusions and Suggestions for interventions:

- ***The bottom of the class is not hopeless***
- **An intervention focused on study skills...**
 - (1) achieves performance gains similar to a content focus,
 - (2) appears to generate more desired behaviours,
 - (3) does not appear to increase student study time
- **For an effective intervention...**
 - (1) course components need to be aligned (learning goals, assignments, assessments,...)
 - (2) Instructors need to provide students with specific recommendations for how to successfully study in their course.

Comments? Questions?